Dublin Algebra One Semester One Exam Review Packet 2014

19. Juan is making birdhouses to sell at a craft show. The cost of making the birdhouses is $80 plus $6.25 per birdhouse. He will sell them for $16 each. Write and solve an inequality to find the number of birdhouses he must sell to make a profit.

Let x = # of birdhouses

$80 + 6.25x < 16x$

$-6.25x \quad -6.25x$

$\frac{80}{9.75} < \frac{9.75x}{9.75}$

$8.205 < x$

Juan must sell 9 birdhouses to make a profit.

20. Solve the Inequality $-3x \leq -21$

$\frac{-3x}{-3} \geq \frac{-21}{-3}$

$\boxed{x \geq 7}$

MODULE 3 Functions and Models

1. A restaurant sells tea for $1.50 per cup. A group of 6 people orders drinks.
   a. Write a function for the cost of tea depending on the number of cups ordered.

   $f(x) = 1.5x$

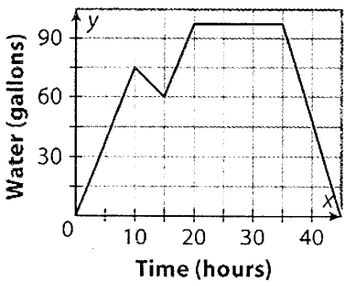
   b. Find a reasonable domain for the situation.

   $\{0, 1, 2, 3, 4, 5, 6\}$

   c. Find a reasonable range for the situation.

   $\{0, 1.5, 3, 4.5, 6, 7.5, 9\}$

2. The amount of water in Nir's rain barrel is represented on the graph. Is each of the following a possible interpretation of the graph?

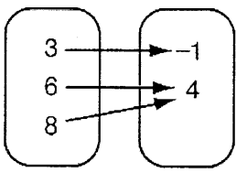


A The barrel started off empty.
☒ Yes ○ No

B Nir used water from the barrel to water her plants after 35 hours.
☒ Yes ○ No

C It rained for the first 10 hours.
☒ Yes ○ No

3. Find the domain of the relation represented on the mapping diagram.



3, 6, 8

4. Kim burns 85 calories per hour hiking. Identify the independent and dependent variables of this situation.

Independent variable
# of hours hiking
Dependent variable
# of calories burned

Dublin Algebra One Semester One Exam Review Packet 2014

5. Is each of the following a function?

A (2, 1), (4, 3), (6, 5), (8, 7)

☒ Yes ○ No

B (2, 1), (4, 3), (6, 5), (2, 7)

○ Yes ☒ No

C (2, 1), (4, 1), (6, 5), (8, 7)

☒ Yes ○ No

6. The table below shows the relationship between the size of a painting by a particular artist and the price the gallery charges for the painting.

Painting size, in^2 (x)	6	8	10
Price, dollars (y)	30	40	50

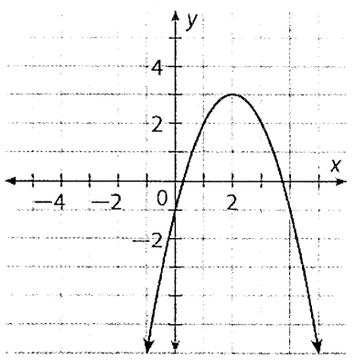
Write a function that describes the relationship and use it to find the price of a 16 in^2 painting.

$f(x) = 5x$

$f(16) = 5(16)$

$f(16) = \$80$

7. The graph of $f(x) = -x^2 + 4x - 1$ is below.



Find the value of $f(x)$ when $x = 0$.

$f(0) = -1$

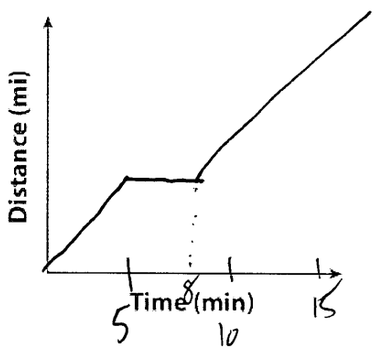
8. If f(x) = -2x + 7, then what is the value of f(-6)?

$f(-6) = -2(-6) + 7$

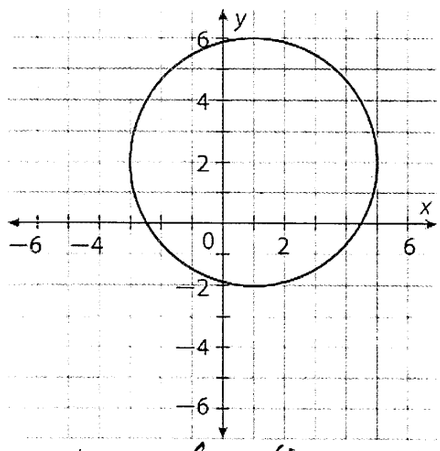
$f(-6) = 12 + 7$

$f(-6) = 19$

9. Varun drove to work this morning. It took him 15 minutes. He stopped at a traffic light for 3 minutes after driving for 5 minutes. Sketch a graph to represent the distance from Varun's house during his drive to work.



10. Is the relation represented on the graph below a function? Explain your answer.



No, not a function. It does not pass vertical line test. Some x-values match up to more than one y value.

Dublin Algebra One Semester One Exam Review Packet 2014

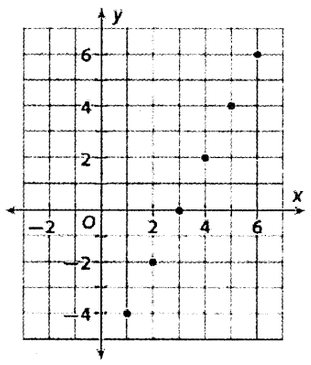
(8)

MODULE 4

Patterns and Sequences

1

Leia sells homemade fruit bars. The profit she makes in dollars, y, from the number of bars she sells, x, is represented on the graph.



a. Find the common difference of the sequence.

2

b. Write a recursive rule for the sequence.

$f(1) = -4$; $f(n) = f(n-1) + 2$

c. Write an explicit rule for the sequence.

$f(n) = 2n - 6$

d. In July, Leia sold 32 fruit bars. What was her profit in July?

$58.00

2. What is the fifth term of the sequence defined by $f(n) = 3(n-3)$?

$f(5) = 3(5-3)$

$f(5) = 3(2)$

$f(5) = 6$

3. The first term of a sequence with the recursive rule $f(n) = 2f(n-1) + 2$ is 4.

Choose True or False.

A The second term is 6.
○ True ⊗ False

B The third term is 22.
⊗ True ○ False

C The fourth term is 46.
⊗ True ○ False

n	f(n)
1	4
2	10
3	22
4	46

4. Which explicit function defines the sequence $-8, -6, -4, \ldots$?

A $f(n) = -10 - n$

B $f(n) = -10 + n^2$

C $f(n) = n - 9$

(D) $f(n) = 2n - 10$

5. Is each of the following an arithmetic sequence?

A	$\frac{1}{3}, 1, 1\frac{2}{3}, 2\frac{1}{3} \ldots$	⊗ Yes	○ No
B	$-12, -4, 0, 2 \ldots$	○ Yes	⊗ No
C	$-6, 0, 6, 12 \ldots$	⊗ Yes	○ No
D	$-20, 15, -10, 5 \ldots$	○ Yes	⊗ No

6. Write a recursive rule for the sequence 10, 18, 26, 34....

$f(1) = 10$

$f(n) = f(n-1) + 8$

Dublin Algebra One Semester One Exam Review Packet 2014

Use the table for 7–9.

Time in minutes, n	2	4	6
Elevation of a scuba diver in feet, $f(x)$	–4	–8	–12

7. What is the common difference of the sequence represented in the table?

-2

8. Write an explicit rule for the sequence.

$f(n) = -2n$

9. Find the elevation of the diver after 15 minutes.

-30 feet

10

Write a recursive function for the sequence 1, -2, -5, -8....

$f(1) = 1$

$f(n) = f(n-1) - 3$

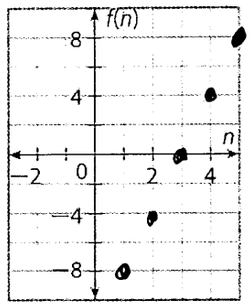
11. Write an explicit rule for the sequence in problem #10.

$f(n) = -3n + 4$

12. a. A sequence is defined by the recursive rule $f(n) = f(n-1) + 4$. The first term is –8. Write the first five terms of the sequence.

$-8, -4, 0, 4, 8$

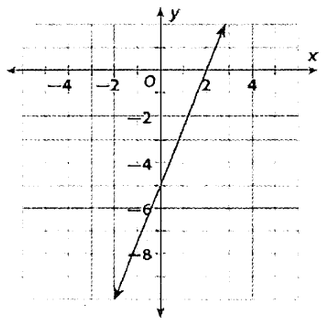
b. Graph the sequence.



MODULE 5

Linear Functions

1.



a. What are the x- and y-intercepts of the line graphed above?

$(2, 0)$ & $(0, -5)$

b. What is the slope of the line?

$\frac{5}{2}$

c. Write an equation for the line in standard form.

$5x - 2y = 10$

$(-5x + 2y = -10)$

Dublin Algebra One Semester One Exam Review Packet 2014

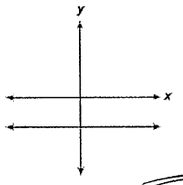
2. Is each of the functions a linear function?

A	$y = 4x - 7$	⊗ Yes	○ No
B	$y = 6x^2 - 1$	○ Yes	⊗ No
C	$y = \frac{1}{2x} + 10$	○ Yes	⊗ No
D	$y = -7$	⊗ Yes	○ No

3. Does each of the following equations describe a line with an x-intercept of 7?

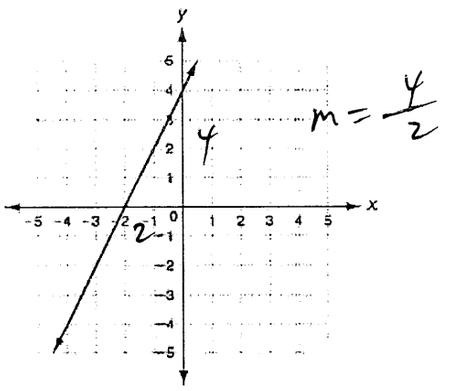
A	$-2x - 7y = -14$	⊗ Yes	○ No
B	$3x + 2y = 14$	○ Yes	⊗ No
C	$-4x + 2y = -28$	⊗ Yes	○ No
D	$x = 7$	⊗ Yes	○ No

6. What describes the slope of the line shown on the graph below?



A positive
B negative
C 0
D undefined

7. What is the slope of the line below?



$m = 2$

Use the information below for 4–5.

Stanley is running a 5-mile race. He runs 1 mile every 7 minutes. Stanley's distance from the finish line after x minutes is represented by the function $x + 7y = 35$.

4. Find and interpret the x-intercept.

(35, 0) The x-intercept is the # of minutes Stanley must run to finish the race.

5. Find and interpret the y-intercept.

(0, 5) The y-intercept is the Distance in miles to the finish line.

8. Do the lines for each of the following equations have a positive slope?

A	$2x + 2y = 2$	○ Yes	⊗ No
B	$y = -\frac{2}{3}x$	○ Yes	⊗ No
C	$-x + 2y + 4 = 0$	⊗ Yes	○ No
D	$9.5x + 0.6y = 0$	○ Yes	⊗ No